

**REMARKS/ARGUMENTS**

Re-examination and favorable reconsideration in light of the above amendments and the following comments are respectfully requested.

Claims 1 - 15 are currently pending in the application. All pending claims have been rejected.

By the present amendment, independent claims 1, 6, 12, and 15 have been amended and new claims 16 and 17 have been added to the application. Further, claim 7 has been amended to correct an inadvertent error.

In the office action mailed July 14, 2004, claim 15 was rejected under 35 U.S.C. 102(b) over U.S. Patent No. 6, 119,978 to Kobayashi et al.; claims 1 - 5 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,405,242 to Auxier et al. in view of U.S. Patent No. 5,640,787 to Jackson et al.; claims 6 - 9 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,375,233 to Rossmann et al. in view of U.S. Patent No. 4,096,296 to Galmiche et al.; claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over Rossmann et al. in view of Galmiche et al, and further in view of U.S. Patent No. 6,190,133 to Ress, Jr. et al.; and claims 12 - 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,384,607 to Wood et al.

in view of U.S. Patent No. 4,569,384 to Mills and further in view of Jackson et al.

The foregoing rejections are traversed by the present response.

With regard to the rejection of claim 15, the claim has been amended to call for a refractory metal core for use in a casting system comprising means for casting an object, said casting means comprising a honeycomb structure formed from a refractory sheet material, said honeycomb structure having a plurality of dimples internally supported by ribs. It is submitted that Kobayashi does not teach or suggest such a refractory metal core. The portions of Kobayashi relied upon by the Examiner are directed to a leading edge structure for an airfoil and not a honeycomb structure which is used to cast an object. In light of the foregoing, the Examiner is hereby requested to withdraw the rejection of claim 15 over Kobayashi.

New claim 16 is allowable for the same reasons as claim 15 as well as on its own accord. Kobayashi does not teach or suggest any casting core.

With regard to the rejection of claims 1 - 5 over the combination of Auxier et al. and Jackson et al., claim 1 has been amended to call for a casting system for forming a gas turbine engine component, said system comprising a casting core

formed by a shaped refractory metal sheet having a plurality of features for forming a plurality of film cooling passages, said features being formed from refractory metal material bent out of said sheet. The primary reference to Auxier et al. does not teach or suggest a casting core formed by a shaped refractory metal sheet having a plurality of features for forming a plurality of film cooling passages. Additionally, Auxier et al. does not teach or suggest forming the features from refractory metal material bent out of the sheet. The so-called features in Auxier et al. are nothing more than holes 122 formed in the metal sheet 100. The secondary reference to Jackson et al. does not cure the aforementioned deficiencies of Auxier et al. As for the combination of Auxier et al. and Jackson et al., there is no reason to combine the references in the manner suggested by the Examiner. There is no reason to form the metal sheet 100 out of a refractory material.

Claims 2 - 5 are allowable for the same reasons that claim 1 is allowable as well as on their own accord.

The Examiner is hereby requested to withdraw the rejection of claims 1 - 5 on obviousness grounds.

With regard to the rejection of claims 6 - 9 and 11 over the combination of Rossmann et al. in view of Galmiche et al., claim 6 now calls for a casting system for forming a gas turbine

engine component comprising a metal wall having an airfoil shape and a refractory metal casting core adjacent said metal wall and having a shape corresponding to the shape of said metal wall.

It is submitted that neither Rossmann et al. nor Galmiche et al. teaches or suggests a casting system having a metal wall with an airfoil shape and a refractory metal casting core adjacent the metal wall and having a shape corresponding to the shape of the metal wall. Rossmann et al. merely shows a non-airfoil shaped metal core (it should be noted that the core in Rossmann et al. has a fir tree) and a ceramic airfoil. The metal core clearly has a different shape than the ceramic airfoil 1. While Galmiche may show the use of a refractory metal material, there is no reason to make the core in Rossmann et al. out of a refractory material. Additionally, Gsalmiche et al. does not cure the aforementioned deficiencies of Rossmann et al. For these reasons, claim 6 is allowable.

Claims 7 - 9 and 11 are allowable for the same reasons that claim 6 is allowable as well as on their own accord.

With regard to the rejection of claim 10, the tertiary reference to Ress, Jr. et al. does not cure the above-noted deficiencies of the Rossmann et al. and Galmiche et al. references. Therefore, claim 10 is allowable for the same reasons that claim 6 is allowable as well as on its own accord.

New claim 17 is allowable because neither of the cited and applied Rossmann et al. and Galmiche et al. references teaches or suggests the subject matter of this claim.

With regard to the rejection of claims 12 - 14 over the combination of Woods, Mills and Jackson et al., claim 12 has been amended to call for a refractory metal core for use in a casting system comprising a casting core having an outer surface formed from a refractory metal material, said outer surface defining an internal cavity filled with an inert material selected from the group consisting of pressurized inert gas, sand, and ceramic powder. A review of the Woods patent shows that it relates to a method of casting a blade or vane for a gas turbine engine. In this method, a first die formed by elements 10 and 11 are used to form a filler piece 12. In order to work properly, the material forming the filler piece 12 must be in fluid, slurry, or plastic form. The filler piece 12 is then placed into a second die for forming a ceramic core to be used in the molding process for forming the blade or vane. The second die has die halves 20 and 19. As pointed out in column 3, lines 25 et seq., the die formed by halves 19 and 20 is filled with a fluid, plastic or slurry material and subjected to a treatment which causes the material to solidify. The material which is used to form the core 21 is identified as a ceramic

material. The core 21 is then used in the investment casting system of FIG. 4. As described in column 4, lines 24 et seq., molten metal is poured into the space between the core and the mold to form the turbine blade or vane. Clearly, Wood does not teach or suggest a casting core having an outer surface formed from a refractory metal material, which outer surface defines an internal cavity filled with an inert material selected from the group consisting of pressurized inert gas, sand, and ceramic powder. The secondary reference to Mills may teach dissolving ceramic core material; however, this does not cure the above noted deficiencies of Wood. The tertiary reference to Jackson may teach the use of refractory material; however, neither Wood nor Mills has any use for forming an outer surface of a core from a refractory material. In fact, if one forms the core from a refractory material, then Mills serves no purpose. Certainly, Jackson et al. does not cure the above-noted deficiencies of Wood - namely the absence of an outer surface defining an internal cavity filled with an inert material. It is submitted that these references are not properly combined and, even if they were, they would not teach or suggest the invention set forth in claim 12.

Claims 13 and 14 are allowable for the same reasons that claim 12 is allowable as well as on their own accord.

The instant application is believed to be in condition for allowance for the reasons set forth above. Such allowance is respectfully solicited.


Should the Examiner believe an additional amendment is needed to place the case in condition for allowance, the Examiner is hereby invited to contact Applicant's attorney at the telephone number listed below.

No fee is believed to be due as a result of this response. Should the Commissioner determine that a fee is due, he is hereby authorized to charge said fee to Deposit Account No. 21-0279.

Respectfully submitted,

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I, Nicole Motzer, hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on October 14, 2004.

